

TSMC01-167

1. A process for performing CMP, comprising:

providing a dielectric layer having a first surface;

forming a cavity in said dielectric layer;

onto said first surface depositing a layer of tungsten, whereby said cavity becomes

5 overfilled with tungsten;

polishing said tungsten layer with a slurry that comprises a suspension of abrasive particles in deionized water, hydrogen peroxide, and TMAH until said cavity is just filled with tungsten, having a second surface, and there is no tungsten on said first surface; and

10 rinsing said tungsten layer in deionized water whereby there is no oxide layer on said second surface and all of said abrasive particle have been removed.

2. The process described in claim 1 wherein the TMAH has a concentration in said slurry of between about 2% and 20%.

3. The process described in claim 1 wherein said abrasive particles are selected from the group consisting of alumina and silica.

15 4. The process described in claim 1 wherein said abrasive particles have a mean diameter of between about 1 and 10,000 microns.

5. A process for performing CMP, comprising:

TSMC01-167

providing a dielectric layer having a first surface;

forming a cavity in said dielectric layer;

onto said first surface depositing a layer of tungsten, whereby said cavity becomes overfilled with tungsten;

5 polishing said tungsten layer with a slurry that comprises a suspension of abrasive particles in deionized water, hydrogen peroxide, and TBAH until said cavity is just filled with tungsten, having a second surface, and there is no tungsten on said first surface; and
 rinsing said tungsten layer in deionized water whereby there is no oxide layer on said second surface and all of said abrasive particle have been removed.

10 6. The process described in claim 5 wherein the TBAH has a concentration in said slurry of between about 2% and 20%.

7. The process described in claim 5 wherein said abrasive particles are selected from the group consisting of alumina and silica.

15 8. The process described in claim 5 wherein said abrasive particles have a mean diameter of between about 1 and 10,000 microns.

9. A process for performing CMP, comprising:
 providing a dielectric layer having a first surface;

TSMC01-167

forming a cavity in said dielectric layer;

onto said first surface depositing a layer of tungsten, whereby said cavity becomes overfilled with tungsten;

5 on a first platen, polishing said tungsten layer with a slurry that comprises a suspension of abrasive particles in deionized water, and hydrogen peroxide until said cavity is just filled with tungsten, having a second surface, and there is no tungsten on said first surface;

on a second platen, polishing said second surface with an aqueous solution of TMAH, whereby there is no oxide layer on said second surface; and

10 on a third platen, buffing said second surface with deionized water whereby all of said abrasive particles get removed.

10. The process described in claim 9 wherein the TMAH has a concentration in said aqueous solution of between about 2% and 20%.

11. The process described in claim 9 wherein said abrasive particles are selected from
15 the group consisting of alumina and silica.

12. The process described in claim 9 wherein said abrasive particles have a mean diameter of between about 1 and 10,000 microns.

TSMC01-167

13. A process for performing CMP, comprising:

providing a dielectric layer having a first surface;

forming a cavity in said dielectric layer;

onto said first surface depositing a layer of tungsten, whereby said cavity becomes

5 overfilled with tungsten;

on a first platen, polishing said tungsten layer with a slurry that comprises a suspension of abrasive particles in deionized water, and hydrogen peroxide until said cavity is just filled with tungsten, having a second surface, and there is no tungsten on said first surface;

10 on a second platen, polishing said second surface with an aqueous solution of TBAH, whereby there is no oxide layer on said second surface; and

on a third platen, buffing said second surface with deionized water whereby all of said abrasive particles get removed.

14. The process described in claim 13 wherein the TBAH has a concentration in said
15 aqueous solution of between about 2% and 20%.

15. The process described in claim 13 wherein said abrasive particles are selected from the group consisting of alumina and silica.

16. The process described in claim 13 wherein said abrasive particles have a mean

TSMC01-167

diameter of between about 1 and 10,000 microns.

17. A surface treatment process, comprising:

providing a hydrophilic surface;

polishing said surface with a slurry that comprises a suspension of abrasive

particles in deionized water and TMAH, whereby said surface is rendered hydrophobic;

and

thereby causing all of said abrasive particles to be removed when said surface is rinsed in deionized water.

18. The process described in claim 17 wherein the TMAH has a concentration in said

deionized water of between about 2% and 20%.

19. The process described in claim 17 wherein said abrasive particles are selected from the group consisting of alumina and silica.

20. The process described in claim 17 wherein said abrasive particles have a mean diameter of between about 1 and 10,000 microns.

21. The process described in claim 17 wherein said hydrophilic surface is selected from the group consisting of tungsten, silicon oxide, and copper.

TSMC01-167

22. A surface treatment process, comprising:

providing a hydrophilic surface;

polishing said surface with a slurry that comprises a suspension of abrasive particles in deionized water and TBAH, whereby said surface is rendered hydrophobic;

5 and

thereby causing all of said abrasive particles to be removed when said surface is rinsed in deionized water.

23. The process described in claim 22 wherein the TBAH has a concentration in said deionized water of between about 2 and 20%.

10 24. The process described in claim 22 wherein said abrasive particles are selected from the group consisting of alumina and silica.

25. The process described in claim 22 wherein said abrasive particles have a mean diameter of between about 1 and 10,000 microns.

15 26. The process described in claim 22 wherein said hydrophilic surface is selected from the group consisting of tungsten, silicon oxide, and copper.

27. A process for performing CMP, comprising:

TSMC01-167

providing a dielectric layer having a first surface;

forming a cavity in said dielectric layer;

onto said first surface depositing a layer of copper, whereby said cavity becomes overfilled with copper;

5 polishing said copper layer with a slurry that comprises a suspension of abrasive particles in deionized water, hydrogen peroxide, and TMAH until said cavity is just filled with copper, having a second surface, and there is no copper on said first surface; and
 rinsing said copper layer in deionized water whereby there is no oxide layer on said second surface and all of said abrasive particle have been removed.

10 28. The process described in claim 27 wherein the TMAH has a concentration in said slurry of between about 2% and 20%.

29. A process for performing CMP, comprising:

 providing a dielectric layer having a first surface;

 forming a cavity in said dielectric layer;

15 onto said first surface depositing a layer of copper, whereby said cavity becomes overfilled with copper;

 polishing said copper layer with a slurry that comprises a suspension of abrasive particles in deionized water, hydrogen peroxide, and TBAH until said cavity is just filled with copper, having a second surface, and there is no copper on said first surface; and

TSMC01-167

rinsing said copper layer in deionized water whereby there is no oxide layer on said second surface and all of said abrasive particle have been removed.

30. The process described in claim 29 wherein the TBAH has a concentration in said slurry of between about 2% and 20%.